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EXPLANATION OF PLATE III.

- Fig. 1. Egg of *Composia fidelissima* enlarged $\times 20$.
 " 2. Larva, stage I $\times 18$.
 " 3. Mature larva, natural size.
 " 4. Front view of the head $\times 10$, showing the setæ.
 " 5. Pupa, slightly enlarged.
 " 6. A group of scales from the body of the pupa $\times 40$.
 " 7. Some of the hooks of the cremaster $\times 30$.
 " 8. One of the head hooks $\times 40$.
 " 9. Genealogical tree of the Lepidopterous superfamily Noctuina, showing the probable origin of the North American families from a Tineid stock. The European Lemoniidae are included as a connecting link. The narrow cross bars indicate points at which cubitus became 4-branched on the fore wings; the broad shaded bars, points at which the larva-tubercles became warts.
 " 10. Mature larva of *Syntomeida epilais*, natural size.

FOOD-HABITS OF NORTH AMERICAN CERAMBYCIDÆ.

BY WILLIAM BEUTENMULLER.

In the American Entomologist, Vol. III, 1880, pp. 237 and 270, the late Dr. C. V. Riley published a paper on the food-habits of the long-horn beetles or wood-borers. Since then considerable has been added to our knowledge on the food-habits of this family of beetles. It has therefore been deemed advisable to republish Dr. Riley's paper with such additions which have been made. For personal credit the reader is referred to Dr. Riley's paper and Packard's Fifth Report U. S. Entomological Commission. We are also indebted to Mr. L. H. Joutel for many notes incorporated in the present paper and which have not been published elsewhere.

Ergates spiculatus Lec.—This western species is recorded as living in the roots of coniferous trees, especially pine.

Mallodon dasystomus Say.—Bores in the wood of oak, hackberry (*Celtis*) and pecan hickory, and undoubtedly other species of hickory.

Mallodon melanopus Linn.—Lives in box elder (*Negundo aceroides*), oak and hackberry (*Celtis*).

Mallodon serrulatus *Lec.*—Breeds in hackberry (*Celtis*), and probably also oak.

Orthosoma brunneum *Forst.*—Bores in decaying pine, hemlock and probably other coniferous trees, also in hickory, walnut, oak and chestnut.

Prionus laticollis *Drury.*—Lives in the trunks and roots of linden poplar, oak, chestnut, apple, pine and grapevine.

Prionus californicus *Mots.*—Breeds in decaying stumps and roots of live-oak.

Prionus pocularis *Dalm.*—Infests the roots and stumps of pine.

Prionus imbricornis *Linn.*—Lives in roots of grapevine, pear trees and herbaceous plants.

Homoæsthes emarginatus *Say.*—Is supposed to live in trunk and roots of pine.

Tragosoma harrisii *Lec.*—Breeds in stumps of decaying pine trees.

Asemum mœstum *Hald.*—Lives under and in the bark of oak, pine, spruce and other conifers and also in roots of grapevine.

Asemum atrum *Esch.*—Bores in the trunk of pine trees.

Criocephalus nubilus *Lec.*—Lives in the roots of pine, as does *C. agrestis* Kby., and probably also the other species of the genus.

Smodicum cucujiforme *Say.*—Breeds under bark of oak, hackberry and beech.

Physocnemum brevilineum *Say.*—Lives in dry wood of elm trees.

Hylotrupes bajulus *Linn.*—Inhabits fir, spruce, pine, hemlock and other coniferous trees.

Hylotrupes ligneus *Fab.*—Bores under the bark of cedar (*Juniperus*).

Phymatodes variabilis *Fabr.*—Lives under bark and in the branches of oak and hickory.

Phymatodes varius *Fabr.*—This species like *P. variabilis*, also lives in oak and hickory.

Phymatodes amœnus *Say.*—Bores in dead wood of grapevine.

Phymatodes obscurus *Lec.*—Has been bred from branches of live-oak in California.

Callidium antennatum Newm.—Breeds under the bark of pine and cedar (*Juniperus*), making tortuous galleries.

Callidium janthinum Lec.—Lives under bark of pine.

Callidium æreum Newm.—Has been bred from chestnut logs.

Oeme gracilis Lec.—Lives in dead wood of oak (*Quercus agrifolia*) in California.

Dryobius sexfasciatus Say.—Lives in oak and beech, under the bark.

Gracilia minuta Fabr.—Breeds in the wood of the sweet birch (*Betula lenta*). Raised from oak twigs by Mr. Joutel.

Chion cinctus Drury.—Bores in the trunk of hickory.

Eburia 4-geminata Say.—Lives in the trunk of honey-locust, hickory and probably also in ash.

Romaleum atomarium Dr.—Bores in the twigs of oak, hackberry (*Celtis*), and in the dry leaf stems of palmetto.

Elaphidion inerme Newm.—Bores in the twigs of oak and orange.

Elaphidion mucronatum Fabr.—Bores in twigs of oak, hackberry, palmetto and grapevine.

Elaphidion parallelum Newm.—Breeds in twigs of oak, hickory plum, apple and grape.

Elaphidion villosum Fabr.—Lives in the twigs of oak, hickory, beech, chestnut, birch, sumac, plum, apple and grapevine.

Elaphidion irroratum Fabr.—Bores in the trunk of black mangrove in Florida.

Tylonotus bimaculatus Hald.—Found under bark of tulip tree, also lives in ash and dead hickory.

Heterachthes 4-maculatus Newm.—Breeds in branches of hickory.

Phyton pallidum Say.—Lives in branches of hickory.

Megobrium edwardsii Lec.—Lives in wood of live-oak in California.

Molorchus bimaculatus Fabr.—Has been bred from hickory branches, also bores in maple twigs.

Callichroma splendidum Lec.—Breeds in wood of gum-elastic tree in Texas.

Megaderus bifasciatus *Dup.*—Has been taken from cedar timber in Texas.

Tragidion coquus *Linn.*—Bores in oak.

Tragidion armatum *Lec.*—Breeds in the flower stalks of *Yucca angustifolia* (Townsend).

Purpuricenus humeralis *Fabr.*—Lives in oak stumps.

Schizax senax *Lec.*—Lives in dead wood of apricot.

Stenophenus notatus *Oliv.*—Breeds in dead hickory limbs.

Cyllene antennatus *White.*—Lives in the wood of mesquite in Arizona.

Cyllene picta *Drury.*—Bores in the solid wood under the bark of hickory, walnut, butternut and occasionally in the honey-locust (*Gleditschia*).

Cyllene robinæ *Forst.*—Very destructive to the trunks of locust.

Cyllene crinicornis *Chev.*—Has been taken in Texas on sycamore (*Platanus*), in the wood of which the species probably breeds.

Plagionotus speciosus *Say.*—Lives in the solid wood of sugar maple.

Calloides nobilis *Say.*—Breeds in chestnut and oak trees; also beaten from hickory by Mr. Joutel.

Arhopalus fulminans *Fabr.*—Bores in the sap wood of chestnut and oak.

Xylotrechus annosus *Say.*—Breed in the wood of willow.

Xylotrechus convergens *Lec.*—Has been bred from a branch of a species of thorn (*Cratægus*).

Xylotrechus colonus *Fabr.*—Bores under bark of maple, oak and hickory.

Xylotrechus nauticus *Mann.*—Has been bred from dead branches of live-oak in California, also from *Eucalyptus*.

Xylotrechus undulatus *Say.*—Beaten from spruce (*Abies*) in the wood of which the species probably breeds.

Neoclytus erythrocephalus *Fabr.*—Breeds in trunk and branches of hickory, ash, elm, oak, chestnut and pine, also beaten from locust.

Neoclytus muricatulus *Kby.*—Breeds in the trunk and branches of pine.

Neoclytus luscus *Lec.*—Breeds in hickory limbs and probably also in the trunk of the tree.

Neoclytus capræa *Say.*—Bores in ash, elm and hickory, limbs and trunks.

Clytanthus albofasciatus *Lap.*—Lives in the limbs of hickory and in the wood of the grapevine. *C. ruricola* also breeds in hickory.

Microclytus gazellula *Hald.*—Bores in the branches of oak.

Cyrtophorus verrucosus *Oliv.*—Lives in the wood of wild red cherry and quince; has also been beaten from hickory.

Tillomorpha geminata *Hald.*—Has been bred from branches of hickory.

Eudercus pini *Oliv.*—Occurs on pine trees.

Eudercus picipes *Fabr.*—Has been raised from hickory and chestnut branches.

Zagymnus clerinus *Lec.*—Bores in the dry leaf stems of palmetto in Florida.

Atimia confusa *Say.*—Occurs on pine tree.

Distenia undata *Oliv.*—Bores in the wood of chestnut and hornbeam (*Carpinus*).

Desmocerus palliatus *Forst.*—Lives in the lower parts of the stems of elder. *D. auripennis*, also lives in the same plant.

Rhagium lineatum *Oliv.*—Lives under the bark of pine and spruce.

Anthophilax mirificus *Bland.*—Has been found under the bark of spruce (*Abies menziesii*).

Gaurotes cyanipennis *Say.*—Has been found ovipositing on butternut and oak.

Bellamira scalaris *Say.*—The beetle and pupa of this species have been taken under bark of the yellow birch (*Betula lutea*), also found ovipositing on maple.

Typocerus zebratus *Fabr.*—This species mines the oak.

Leptura zebra *Oliv.*—Inhabits the oak, chestnut and pine.

Leptura vagans *Oliv.*—Lives in wood of yellow birch (*Betula lutea*).

Leptura emarginata *Fabr.*—Has been found ovipositing in limbs of white oak by Mr. Joutel.

Leptura abdominalis *Hald.*—Lives in the wood of red cedar (*Juniperus*).

Leptura canadensis *Fabr.*—Breeds in the trunk of hemlock (*Tsuga Canadensis*).

Ipochnus fasciatus *Lec.*—Lives in the wood of sumac (*Rhus integrifolia* and *laurina*). *I. pubescens* Casey, has similar habits.

Monilema.—The species of this genus are said to feed on various species of prickly pear, and the larvæ probably live in the wood and roots of these plants.

Cyrtinus pygmaeus *Hald.*—Has been bred from locust (*Robinia pseudacacia*), also beaten from hickory.

Psenocerus supernotatus *Say.*—Lives in the wood of dogwood (*Cornus*), apple, and in the stems of the currant.

Monohammus.—The larvæ of this genus bore in the solid wood and in large branches of pine, fir (*Abies*), and probably other coniferous trees.

Dorcaschema nigrum *Say.*—Breeds in dead limbs of hickory.

Dorcaschema alternatum *Say.*—Found in mulberry and osage orange. *D. wildii* is also found on these trees, and their larvæ probably live in the roots or trunks.

Hetæmis cinerea *Oliv.*—Has been taken on mulberry (*Morus rubra*), and probably lives in the wood of this tree.

Cacoplia pullata *Hald.*—Beaten from oak by Mr. Joutel.

Goes tigrina *De G.*—Bores in the solid wood of hickory, oak and walnut, but seems to prefer white oak.

Goes pulchra *Hald.*—Bores in various species of hickory.

Goes pulverulenta *Hald.*—Breeds in the branches of beech (*Fagus ferrugineus*) and hornbeam (*Carpinus*).

Goes oculata *Lec.*—Found on hickory also *G. debilis*, which also breeds in oak branches.

Goes tessellata *Hald.*—Breeds in oak.

Plectodera scalator *Fabr.*—Bores in the roots of cottonwood (*Populus*) and willow.

Acanthoderes 4-gibbus *Say.*—Breeds in the twigs of hickory, oak, beech and hackberry (*Celtis*).

Acanthoderes decipiens *Hald.*—Bores in twigs of hickory.

Acanthoderes morrisii *Uhler.*—Lives in twigs of the tulip-tree.

Leptostylus aculiferus Say.—Breeds under bark of sweet-gum (*Liquidambar*), oak and apple; also reported as boring in osage orange.

Leptostylus biustus Lec.—Lives in dead branches of orange in Florida. Breeds in hickory twigs (Joutel).

Leptostylus commixtus Hald.—Breeds in the wood of locust.

Leptostylus macula Say.—Lives in the twigs and under bark of chestnut, oak, hickory, walnut, apple and butternut.

Liopus variegatus Hald.—Has been bred from dead chestnut branches.

Liopus fascicularis Harr.—Bores in dead wood of prickly-ash (*Xanthoxylus*) and locust.

Liopus cinereus Lec.—Has been bred from twigs of locust and hickory.

Liopus crassulus Lec.—Bores in dead twigs of hackberry (*Celtis*) in Texas.

Liopus alpha Say.—Breeds in the twigs of sumac (*Rhus glabra*) and apple.

Dectes spinosus Say.—Has been bred from the stems of the great ragweed (*Ambrosia trifida*).

Lepturges querci Fitch.—Breeds in the twigs of hickory, also beaten from oak.

Lepturges fascetus Say.—Bred from apple branches by Mr. Joutel.

Lepturges symmetricus Hald.—Bred from chestnut branches by Mr. Joutel.

Hyperplatys aspersus Say.—Lives in dry twigs of poplar (cottonwood), hickory and has also been beaten from chestnut.

Hyperplatys maculatus Hald.—Lives in dead parts of the orange in Florida; also breeds in dry twigs of apple, hickory and poplar.

Urographis fasciatus De G.—Lives under the bark of oak, maple and hickory; bred from apple and pear by Mr. Joutel; also beaten from limbs of chestnut.

Urographis triangularis Hald.—Bores under the bark of hackberry (*Celtis*).

Acanthocinus nodosus Fabr. and **A. obsoletus** Oliv.—The larvæ of both these species live under the bark of pine. The latter species also breeds in hickory.

Hoplosia nubila *Lec.*—Larva bores in dry beech and basswood twigs.

Pogonocherus mixtus *Hald.*—Bores in the branches of willow.

Ecyrus dasycerus *Say.*—Larva bores in the twigs of hickory and locust.

Eupogonius vestitus *Say.*—Bred from hickory and beaten from chestnut.

Eupogonius tomentosus *Hald.*—Larva mines the branches of the pine.

Oncideres cingulata *Say.*—Lives in the twigs of hickory, persimmon, oak, cherry, apple, pear, orange, and said to also affect other trees.

Oncideres putator *Thom.*—Larva lives in the twigs of the mesquite in Arizona.

Ataxia crypta *Say.*—Bores in dry cotton stalks, and in dry twigs of hackberry (*Celtis*), box elder (*Negundo aceroides*), and oak.

Hippopsis lemniscata *Fabr.*—The full grown insect and larva has been found in the stalk of *Ambrosia*.

Saperda obliqua *Say.*—Bores in the trunk of the common alder.

Saperda calcarata *Say.*—Bores in the solid wood in the trunk of poplar and also said to live in linden.

Saperda candida *Fabr.*—Lives in the trunks of apple, pear, plum, quince, cherry, thorn, mountain-ash, and june-berry (*Amelanchier*).

Saperda fayi *Bland.*—Breeds in the branches of thorn (*Crataegus*.)

Saperda vestita *Oliv.*—Lives in the large branches and under bark of linden.

Saperda discoidea *Fabr.*—Breeds under the bark of hickory.

Saperda tridentata *Oliv.*—Larva lives under the bark of elm.

Saperda lateralis *Fabr.*—Lives under the bark of hickory.

Saperda mœsta *Lec.*—Lives in the smaller branches of poplar and willow.

Saperda concolor *Lec.*—Bores in young shoots of poplar and willow.

Saperda puncticollis Say.—Breeds in poison-ivy (*Rhus toxicodendron*).

Mecas inornata Say.—Bores in the roots and lower part of the stems of *Helenium tenuifolium*, also recorded as living in the shoots of willow and poplar.

Oberea bimaculata Oliv.—Burrows in the stems of blackberry and raspberry.

Oberea schaumii Lec.—Larva bores in the twigs of cottonwood (poplar).

Oberea mandarina Fabr.—Bores in the twigs of poplar.

Oberea quadricallosa Lec.—Lives in the stems of willow.

Tetraopes tetraophthalmus Forst.—The larva bores in the roots and lower parts of the stem of milkweed (*Asclepias*). The larvæ of the other species of the genus probably also live in a similar manner.

Dysphaga tenuipes Hald.—Breeds in dead limbs of hickory.

NOTE ON GEOGRAPHICAL DISTRIBUTION AND MIMICRY OF APATELA.

By A. RADCLIFFE GROTE, A. M.

The majority of the species of *Apatela* occur in North America, where their range is extraordinarily extended, since they are found from Hudson's Bay territory in the north to the tropical regions in Mexico; they appear to be absent from the West Indies. From North America, north of Mexico, sixty species are described, the European fauna has a total of fifteen (consult Grote, *Die Verwandtschaft zwischen der Noc-tinden-Fauna von Nordamerika und Europa*, *Gerhandl. Gesell. Deutsch. Naturf. und Aerzte*, Bremen, 1890). A surprising number of species have been collected in Bastrop Co., Texas, by Belfrage; from this State twelve species are recorded. From California only four species are certainly known, *perdita*, *spinea*, *lupini*, *felina*; the last is, according to Dr. Dyar, an *Acronycta*, the second and third I have referred to a distinct subgenus, *Merolonche*, but, after seeing the European *menyanthis*, it appears possible to me that *spinea* is congeneric or, at least, related. The bulk of the species are found over the temperate regions of the South American Continent, from Lower Canada to the Gulf; from New